

## T2 Biosystems publishes data supporting diagnostic test T2Candida

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T2 Biosystems, a company developing direct detection products enabling superior diagnostics, today announced the publication of research supporting the Company's flagship diagnostic test, T2Candida, in *Science Translational Medicine*. The research highlights T2Candida as a breakthrough approach to rapid and sensitive identification of species-specific *Candida*, a sepsis-causing fungus, directly from whole blood in approximately three hours, or up to 25 times faster than the current gold standard of blood culture. This publication marks the first clinical study of patient samples with T2 Magnetic Resonance (T2MR) technology. Bloodstream infections of *Candida*, known as candidemia, are associated with a 40% mortality rate, largely due to the elapsed time from infection onset to pathogen diagnosis and treatment, which can take from two to five days with blood culture. With early identification of the specific species, this high mortality rate can be reduced to 11%.

"The rapid detection of *Candida* is of critical need within the healthcare community, where time is of the essence to enable life-saving [treatment decisions](#)," said Eleftherios Mylonakis, MD, Dean's Professor of Medicine, Chief, Infectious Disease Division, Warren Alpert Medical School of Brown University, and investigator in this study. "Studies have shown that each hour of delayed treatment increases the mortality of [sepsis](#) patients significantly, by up to 8% or more. This research outlines how T2 [magnetic resonance](#) can revolutionize the field, with great implications on [mortality rates](#) and healthcare costs."

"This research represents the first time that *Candida* has been identified

directly from whole blood in patient samples with highly sensitive T2MR technology that affords limits of detection as low as 1 CFU/mL," added Tom Lowery, PhD, Vice President, Diagnostics Research & Development, T2 Biosystems, and principle investigator of the study. "Importantly, this T2MR approach to *Candida* identification is also amenable to virtually any molecular, immunoassay or hemostasis target, and we are currently developing a portfolio of products where high sensitivity and rapid detection will have the greatest impact on healthcare."

"T2MR represents a revolutionary, highly-sensitive nanotechnology solution, which can rapidly detect pathogens leading to early intervention that can save lives," said Robert S. Langer, D. Sc., David H. Koch Institute Professor, MIT, and co-founder and board member of T2 Biosystems. "T2Candida exemplifies the potential of nanotechnology to create great advances in healthcare in the near term."

In the paper entitled "T2 magnetic resonance enables nanoparticle-mediated [rapid detection](#) of candidemia in whole blood", the authors introduce a novel diagnostic method based on T2 magnetic resonance (T2MR). The T2Candida assay uses blood-compatible polymerase chain reaction (PCR) to amplify *Candida* DNA, which then binds to superparamagnetic nanoparticles coated with a complementary DNA strand. The binding event causes the nanoparticles to cluster, which changes the sample's T2MR signal. Using this approach, the researchers tested both *Candida*-spiked and patient samples and were able to rapidly, accurately and reproducibly detect five *Candida* species within human whole blood with a limit of detection as low as 1 CFU/mL and a time-to-result of approximately three hours. Spiked samples showed 98% positive agreement and 100% negative agreement between T2MR and blood culture. Clinical samples demonstrated similar concordance with blood culture with the important distinction that T2MR was able to identify *Candida* species in the presence of antifungals, whereas blood

culture could not. This study suggests that rapid diagnosis of specific *Candida* species is achievable with T2MR technology, which is fully automated and applicable to a broad variety of targets.

Provided by MacDougall Biomedical Communications, Inc.

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